

25
CLAIMS

1. In a wireless communication system, a method for supporting power
2 control for a plurality of channels via a common feedback stream, comprising:
3 receiving a plurality of transmissions on the plurality of channels;
4 determining signal quality of the transmission received on each channel;
5 generating power control information for each channel based on the
6 determined received signal quality for transmission received on the channel;
7 multiplexing power control information generated for the plurality of
8 channels on a plurality of feedback substreams defined based on the feedback
9 stream; and
10 transmitting the plurality of feedback substreams.

2. The method of claim 1, wherein each feedback substream is assigned
2 to a respective channel to be independently power controlled.

3. The method of claim 1, wherein the feedback stream is formed by a
2 power control field transmitted in a series of slots, with each slot corresponding
3 to a particular time interval.

4. The method of claim 3, wherein the power control information
2 generated for each feedback substream is transmitted in the power control
3 field.

5. The method of claim 3, wherein each feedback substream is assigned
2 to a respective set of slots.

6. The method of claim 5, wherein the slots assigned to the plurality of
2 feedback substreams are selected based on a particular repeating pattern.

7. The method of claim 3, wherein two feedback substreams are defined.

8. The method of claim 7, wherein the slots assigned to the two feedback
2 substreams are selected based on an "n-m" pattern, wherein n slots are assigned
3 to a first feedback substream for every m slots assigned to a second feedback
4 substream.

9. The method of claim 8, wherein the "n-m" pattern is either "1-1", "2-1",
2 "4-1", or "14-1".

10. The method of claim 1, wherein each feedback substream is
2 associated with a respective feedback rate, and wherein an aggregate feedback
rate for the plurality of feedback substreams is equal to or less than the
4 feedback rate of the feedback stream.

11. The method of claim 10, wherein two feedback substreams are
2 defined, wherein the feedback rate for a first feedback substream is 1000
command/second or greater, and wherein the feedback rate for a second
4 feedback substream is 500 command/second or less.

12. The method of claim 1, wherein the plurality of channels include a
2 dedicated channel and a shared channel.

13. The method of claim 12, wherein the plurality of feedback
2 substreams are utilized for feedback during time periods when the shared
channel is assigned for transmission, and wherein the feedback stream is
4 utilized for feedback during time periods when only the dedicated channel is
assigned.

14. The method of claim 12, wherein the feedback substream assigned to
2 the dedicated channel has a higher feedback rate than that of the feedback
substream assigned to the shared channel.

15. The method of claim 1, wherein the power control information
2 generated for at least one channel comprises power control bits indicative of
whether the received signal quality is above or below a target level.

16. The method of claim 1, wherein the power control information
2 generated for at least one channel comprises values indicative a received signal-
to-noise-plus-interference ratio.

17. The method of claim 1, wherein the wireless communication system
2 conforms to W-CDMA standard.

18. The method of claim 17, wherein the plurality of channels include a
2 downlink dedicated physical channel (downlink DPCH) and a physical
downlink shared channel (PDSCH).

19. In a W-CDMA communication system, a method for supporting
2 independent power control for two channels via a common feedback stream,
comprising:
4 receiving two transmissions on the two channels;
determining signal quality of the transmission received on each channel;
6 generating power control information for each channel based on the
determined received signal quality for transmission received on the channel;
8 multiplexing power control information generated for the two channels
onto first and second feedback substreams defined based on the feedback
10 stream, wherein the first feedback substream has a feedback rate of 1000
commands/second or greater and the second feedback substream has a
12 feedback rate of 500 commands/second or less; and
transmitting two feedback substreams.

20. In a wireless communication system, a method for supporting power
2 control for a plurality of channels via a plurality of feedback substreams,
comprising:
4 receiving a plurality of transmissions on the plurality of channels;
determining signal quality of the transmission received on each channel;
6 generating power control information for each channel based on the
determined received signal quality;
8 multiplexing power control information generated for the plurality of
channels on a plurality of feedback substreams, wherein each feedback
10 substream is defined by a respective field in each slot of a feedback subchannel;
and
12 transmitting the plurality of feedback substreams.

21. The method of claim 20, wherein the plurality of feedback
2 substreams have equal feedback rates.

22. The method of claim 20, wherein two feedback substreams are
2 defined by two fields in each slot.

23. The method of claim 22, wherein the two fields have equal number
2 of bits.

24. A power control unit for use in a wireless communication system,
2 comprising:
4 a signal quality measurement unit configured to receive and process a
4 plurality of transmissions on a plurality of channels to determine signal quality
of the transmission received on each channel; and
6 a power control processor coupled to the signal quality measurement
unit and configured to generate power control information for each channel
8 based on the determined received signal quality, and to multiplex power
control information generated for the plurality of channels onto a plurality of
10 feedback substreams defined based on a single feedback stream.

25. The power control unit of claim 24, wherein the plurality of feedback
2 substreams are assigned to respective sets of slots, with each slot corresponding
to a particular time interval.

26. The power control unit of claim 25, wherein two feedback
2 substreams are defined.

27. The power control unit of claim 26, wherein the slots assigned to the
2 two feedback substreams are selected based on an "n-m" pattern, wherein n
slots are assigned to a first feedback substream for every m slots assigned to a
4 second feedback substream

28. The power control unit of claim 27, wherein the first feedback
2 substream has a feedback rate of 1000 command/second or greater and the
second feedback substream has a feedback rate of 500 command/second or
4 less.